



August 2008

FXLA102

Low Voltage Dual Supply 2-Bit Voltage Translator with Configurable Voltage Supplies and Signal Levels, 3-State Outputs, and Auto Direction Sensing

Features

- Bi-directional interface between two levels from 1.1V to 3.6V.
- Fully configurable: Inputs and outputs track V_{CC} level.
- Non-preferential power-up; either V_{CC} may be powered-up first.
- Outputs remain in 3-state until active V_{CC} level is reached.
- Outputs switch to 3-state if either V_{CC} is at GND.
- Power off protection
- Bushold on data inputs eliminates the need for pull-up or pull-down resistors
- Control input ($\overline{OE}$) is referenced to V_{CCA} voltage.
- Packaged in 8-terminal leadless MicroPak (1.6mm x 1.6mm)
- Direction control not needed.
- 100 Mbps throughput when translating between 1.8V and 2.5V.
- ESD protection exceeds:
 - 15kV HBM (B port I/O to GND) (per JESD22-A114 & Mil Std 883e 3015.7)
 - 8kV HBM (A port I/O to GND) (per JESD22-A114 & Mil Std 883e 3015.7)
 - 2kV CDM (per ESD STM 5.3)

General Description

The FXLA102 is a configurable dual-voltage-supply translator designed for both uni-directional and bi-directional voltage translation between two logic levels. The device allows translation between voltages as high as 3.6V to as low as 1.1V. The A port tracks the V_{CCA} level, and the B port tracks the V_{CCB} level. This allows for bi-directional voltage translation over a variety of voltage levels: 1.2V, 1.5V, 1.8V, 2.5V and 3.3V.

The device remains in 3-state until both VCCs reach active levels, allowing either V_{CC} to be powered-up first. Internal power down control circuits place the device in 3-state if either V_{CC} is removed.

The $\overline{OE}$ input, when high, disables both the A and B ports by placing them in a 3-state condition. The $\overline{OE}$ input is supplied by V_{CCA} .

The FXLA102 supports bi-directional translation without the need for a direction control pin. The two ports of the device have auto-direction sense capability. Either port may sense an input signal and transfer it as an output signal to the other port.

Ordering Information

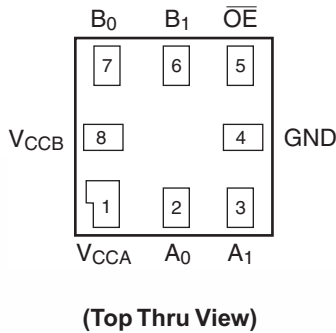
Order Number	Package Number	Product Code Top Mark	Package Description	Supplied As
FXLA102L8X	MAC08A	XF	8-Lead MicroPak, 1.6mm Wide	3k Units on Tape and Reel

All packages are lead free per JEDEC: J-STD-020B standard.

FXLA102 — Low Voltage Dual Supply 2-Bit Voltage Translator with Configurable Voltage Supplies and Signal Levels, 3-State Outputs, and Auto Direction Sensing



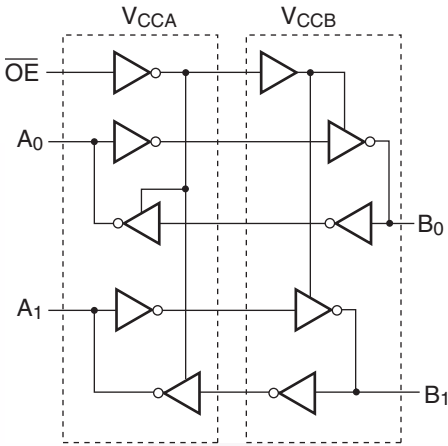
Connection Diagram



Pin Description

Number	Name	Description
1	V _{CCA}	A Side Power Supply
2, 3	A ₀ , A ₁	A Side Inputs or 3-State Outputs
4	GND	
5	$\overline{\text{OE}}$	Output Enable Input
6, 7	B ₁ , B ₀	A Side Inputs or 3-State Outputs
8	V _{CCB}	B Side Power Supply

Functional Diagram



Function Table

Control	Outputs
$\overline{\text{OE}}$	
L	Normal Operation
H	3-State

H = HIGH Logic Level

L = LOW Logic Level

Power-Up/Power-Down Sequencing

FXL translators offer an advantage in that either V_{CC} may be powered up first. This benefit derives from the chip design. When either V_{CC} is at 0 volts, outputs are in a high-impedance state. The control input ($\overline{\text{OE}}$) is designed to track the V_{CCA} supply. A pull-up resistor tying $\overline{\text{OE}}$ to V_{CCA} should be used to ensure that bus contention, excessive currents, or oscillations do not occur during power-up/power-down. The size of the pull-up resistor is based upon the current-sinking capability of the device driving the $\overline{\text{OE}}$ pin.

The recommended power-up sequence is the following:

1. Apply power to the first V_{CC}.
2. Apply power to the second V_{CC}.
3. Drive the $\overline{\text{OE}}$ input LOW to enable the device.

The recommended power-down sequence is the following:

1. Drive $\overline{\text{OE}}$ input HIGH to disable the device.
2. Remove power from either V_{CC}.
3. Remove power from other V_{CC}.

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
V_{CCA}, V_{CCB}	Supply Voltage	−0.5V to +4.6V
V_I	DC Input Voltage I/O Port A I/O Port B Control Input ($\overline{OE}$)	−0.5V to +4.6V −0.5V to +4.6V −0.5V to +4.6V
V_O	Output Voltage ⁽²⁾ Outputs 3-STATE Outputs Active (A_n) Outputs Active (B_n)	−0.5V to +4.6V −0.5V to $V_{CCA} + 0.5V$ −0.5V to $V_{CCB} + 0.5V$
I_{IK}	DC Input Diode Current @ $V_I < 0V$	−50mA
I_{OK}	DC Output Diode Current @ $V_O < 0V$ $V_O > V_{CC}$	−50mA +50mA
I_{OH}/I_{OL}	DC Output Source/Sink Current	−50mA / +50mA
I_{CC}	DC V_{CC} or Ground Current per Supply Pin	±100mA
T_{STG}	Storage Temperature Range	−65°C to +150°C

Note:

1. I_O Absolute Maximum Rating must be observed.

Recommended Operating Conditions⁽²⁾

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Rating
V_{CCA} or V_{CCB}	Power Supply Operating	1.1V to 3.6V
V_I	Input Voltage I/O Port A I/O Port B Control Inputs($\overline{OE}$)	0.0V to 3.6V 0.0V to 3.6V 0.0V to V_{CCA}
	Dynamic Output Current I_{OH}/I_{OL} with V_{CC} @ 3.0V to 3.6V 2.3V to 2.7V 1.65V to 1.95V 1.4V to 1.65V 1.1V to 1.4V	±12.0mA ±8.0mA ±5.0mA ±3.0mA ±2.0mA
	Static Output Current I_{OH}/I_{OL} with V_{CC} @ 1.1V to 3.6V	±4.0μA
T_A	Free Air Operating Temperature	−40°C to +85°C
$\Delta t/\Delta V$	Maximum Input Edge Rate $V_{CCA/B} = 1.1V$ to 3.6V	10ns/V

Note:

2. All unused inputs and I/O pins must be held at V_{CCI} or GND.

DC Electrical Characteristics (T_A = -40°C to +85°C)

Symbol	Parameter	V _{CCA} (V)	V _{CCB} (V)	Conditions	Min.	Typ.	Max.	Units
V _{IHA}	High Level Input Voltage	2.7–3.6	1.1–3.6	Data inputs A _n , Control Input $\overline{\text{OE}}$	2.0			V
		2.3–2.7			1.6			
		1.65–2.3			0.65 x V _{CCA}			
		1.4–1.65			0.65 x V _{CCA}			
		1.1–1.4			0.9 x V _{CCA}			
V _{IHB}		1.1–3.6	2.7–3.6	Data Inputs B _n	2.0			V
			2.3–2.7		1.6			
			1.65–2.3		0.65 x V _{CCB}			
			1.4–1.65		0.65 x V _{CCB}			
			1.1–1.4		0.9 x V _{CCB}			
V _{ILA}	Low Level Input Voltage	2.7–3.6	1.1–3.6	Data Inputs A _n , Control Input $\overline{\text{OE}}$			0.8	V
		2.3–2.7					0.7	
		1.65–2.3					0.35 x V _{CCA}	
		1.4–1.65					0.35 x V _{CCA}	
		1.1–1.4					0.1 x V _{CCA}	
V _{ILB}		1.1–3.6	2.7–3.6	Data Inputs B _n			0.8	V
			2.3–2.7				0.7	
			1.65–2.3				0.35 x V _{CCB}	
			1.4–1.65				0.35 x V _{CCB}	
			1.1–1.4				0.1 x V _{CCB}	
V _{OHA} ⁽³⁾	High Level Output Voltage	1.1–3.6	1.1–3.6	I _{OH} = -4μA	V _{CCA} - 0.4			V
V _{OHB} ⁽³⁾		1.1–3.6	1.1–3.6	I _{OH} = -4μA	V _{CCB} - 0.4			V
V _{OLA} ⁽³⁾	Low Level Output Voltage	1.1–3.6	1.1–3.6	I _{OL} = 4μA			0.4	V
V _{OLB} ⁽³⁾		1.1–3.6	1.1–3.6	I _{OL} = 4μA			0.4	V
I _{I(HOLD)}	Bushold Input Minimum Drive Current	3.0	3.0	V _{IN} = 0.8V	75.0			μA
		3.0	3.0	V _{IN} = 2.0V	-75.0			
		2.3	2.3	V _{IN} = 0.7V	45.0			
		2.3	2.3	V _{IN} = 1.6V	-45.0			
		1.65	1.65	V _{IN} = 0.57V	25.0			
		1.65	1.65	V _{IN} = 1.07V	-25.0			
		1.4	1.4	V _{IN} = 0.49V	11.0			
		1.4	1.4	V _{IN} = 0.91V	-11.0			
		1.1	1.1	V _{IN} = 0.11V		4		
		1.1	1.1	V _{IN} = 0.99V		-4		
I _{I(ODH)} ⁽⁴⁾	Bushold Input Overdrive High Current	3.6	3.6	Data Inputs A _n , B _n	450			μA
		2.7	2.7		300			
		1.95	1.95		200			
		1.6	1.6		120			
		1.4	1.4		80			
I _{I(ODL)} ⁽⁵⁾	Bushold Input Overdrive Low Current	3.6	3.6	Data Inputs A _n , B _n	-450			μA
		2.7	2.7		-300			
		1.95	1.95		-200			
		1.6	1.6		-120			
		1.4	1.4		-80			

DC Electrical Characteristics ($T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$) (Continued)

Symbol	Parameter	V_{CCA} (V)	V_{CCB} (V)	Conditions	Min.	Typ.	Max.	Units
I_I	Input Leakage Current	1.1–3.6	3.6	Control input $\overline{OE}$, $V_I = V_{CCA}$ or GND			± 1.0	μA
I_{OFF}	Power Off Leakage Current	0	3.6	A_n Port, $V_O = 0\text{V}$ to 3.6V			± 2.0	μA
		3.6	0	B_n Port, $V_O = 0\text{V}$ to 3.6V			± 2.0	μA
I_{OZ}	3-State Output Leakage	3.6	3.6	Data Outputs A_n , B_n $V_O = 0\text{V}$ or 3.6V , $\overline{OE} = V_{IH}$			± 5.0	μA
		3.6	0	Data outputs A_n , $V_O = 0\text{V}$ or 3.6V , $\overline{OE} = \text{GND}$			± 5.0	μA
		0	3.6	Data outputs B_n , $V_O = 0\text{V}$ or 3.6V , $\overline{OE} = \text{GND}$			± 5.0	μA
$I_{CCA/B}^{(6)(7)}$	Quiescent Supply Current	1.1–3.6	1.1–3.6	$V_I = V_{CCI}$ or GND, $I_O = 0$, $\overline{OE} = \text{GND}$			10.0	μA
$I_{CCZ}^{(6)(7)}$	Quiescent Supply Current	1.1–3.6	1.1–3.6	$V_I = V_{CCI}$ or GND, $I_O = 0$, $\overline{OE} = V_{IH}$			10.0	μA
I_{CCA}	Quiescent Supply Current	0	1.1–3.6	$V_I = V_{CCB}$ or GND, $I_O = 0$, B-to-A Direction, $\overline{OE} = \text{GND}$			-10.0	μA
		1.1–3.6	0				10.0	μA
I_{CCB}	Quiescent Supply Current	1.1–3.6	0	$V_I = V_{CCA}$ or GND, $I_O = 0$, A-to-B Direction, $\overline{OE} = \text{GND}$			-10.0	μA
		0	1.1–3.6				10.0	μA

Notes:

- This is the output voltage for static conditions. Dynamic drive specifications are given in “Dynamic Output Electrical Characteristics.”
- An external driver must source at least the specified current to switch LOW-to-HIGH.
- An external driver must source at least the specified current to switch HIGH-to-LOW.
- V_{CCI} is the V_{CC} associated with the input side.
- Reflects current per supply, V_{CCA} or V_{CCB} .

Dynamic Output Electrical Characteristics⁽⁸⁾

A Port (An)

Output Load: $C_L = 15\text{pF}$, $R_L \geq 1\text{M}\Omega$ ($C_{I/O} = 4\text{pF}$)

Symbol	Parameter	$T_A = -40^\circ\text{C to } +85^\circ\text{C}, V_{CCA} =$									Units
		3.0V to 3.6V		2.3V to 2.7V		1.65V to 1.95V		1.4V to 1.6V		1.1V to 1.3V	
		Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	
$t_{\text{rise}}^{(9)}$	Output Rise Time A port		3.0		3.5		4.0		5.0	7.5	ns
$t_{\text{fall}}^{(10)}$	Output Fall Time A port		3.0		3.5		4.0		5.0	7.5	ns
$I_{\text{OHD}}^{(9)}$	Dynamic Output Current High	-11.4		-7.5		-4.7		-3.2		-1.7	mA
$I_{\text{OLD}}^{(10)}$	Dynamic Output Current Low	+11.4		+7.5		+4.7		+3.2		+1.7	mA

B Port (Bn)

Output Load: $C_L = 15\text{pF}$, $R_L \geq 1\text{M}\Omega$ ($C_{I/O} = 5\text{pF}$)

Symbol	Parameter	$T_A = -40^\circ\text{C to } +85^\circ\text{C}, V_{CCB} =$									Units
		3.0V to 3.6V		2.3V to 2.7V		1.65V to 1.95V		1.4V to 1.6V		1.1V to 1.3V	
		Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	
$t_{\text{rise}}^{(9)}$	Output Rise Time B port		3.0		3.5		4.0		5.0	7.5	ns
$t_{\text{fall}}^{(10)}$	Output Fall Time B port		3.0		3.5		4.0		5.0	7.5	ns
$I_{\text{OHD}}^{(9)}$	Dynamic Output Current High	-12.0		-7.9		-5.0		-3.4		-1.8	mA
$I_{\text{OLD}}^{(10)}$	Dynamic Output Current Low	+12.0		+7.9		+5.0		+3.4		+1.8	mA

Notes:

8. Dynamic Output Characteristics are guaranteed but not tested.

9. See Figure 5.

10. See Figure 6.

AC Characteristics

V_{CCA} = 3.0V to 3.6V

Symbol	Parameter	T _A = -40°C to +85°C, V _{CCB} =									Units
		3.0V–3.6V		2.3V–2.7V		1.65V–1.95V		1.4V–1.6V		1.1V–1.3V	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	
t _{PLH} , t _{PHL}	A to B	0.2	3.5	0.3	3.9	0.5	5.4	0.6	6.8	10.0	ns
	B to A	0.2	3.5	0.2	3.8	0.3	5.0	0.5	6.0	7.0	ns
t _{PZL} , t _{PZH}	$\overline{OE}$ to A, $\overline{OE}$ to B		1.7		1.7		1.7		1.7	1.7	μs
t _{skew} ⁽¹¹⁾	A Port, B Port		0.5		0.5		0.5		1.0	1.0	ns

V_{CCA} = 2.3V to 2.7V

Symbol	Parameter	T _A = -40°C to +85°C, V _{CCB} =									Units
		3.0V–3.6V		2.3V–2.7V		1.65V–1.95V		1.4V–1.6V		1.1V–1.3V	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	
t _{PLH} , t _{PHL}	A to B	0.2	3.8	0.4	4.2	0.5	5.6	0.8	6.9	10.5	ns
	B to A	0.3	3.9	0.4	4.2	0.5	5.5	0.5	6.5	7.0	ns
t _{PZL} , t _{PZH}	$\overline{OE}$ to A, $\overline{OE}$ to B		1.7		1.7		1.7		1.7	1.7	μs
t _{skew} ⁽¹¹⁾	A Port, B Port		0.5		0.5		0.5		1.0	1.0	ns

V_{CCA} = 1.65V to 1.95V

Symbol	Parameter	T _A = -40°C to +85°C, V _{CCB} =									Units
		3.0V–3.6V		2.3V–2.7V		1.65V–1.95V		1.4V–1.6V		1.1V–1.3V	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	
t _{PLH} , t _{PHL}	A to B	0.3	5.0	0.5	5.5	0.8	6.7	0.9	7.5	11.0	ns
	B to A	0.5	5.4	0.5	5.6	0.8	6.7	1.0	7.0	7.0	ns
t _{PZL} , t _{PZH}	$\overline{OE}$ to A, $\overline{OE}$ to B		1.7		1.7		1.7		1.7	1.7	μs
t _{skew} ⁽¹¹⁾	A Port, B Port		0.5		0.5		0.5		1.0	1.0	ns

V_{CCA} = 1.4V to 1.6V

Symbol	Parameter	T _A = -40°C to +85°C, V _{CCB} =									Units
		3.0V–3.6V		2.3V–2.7V		1.65V–1.95V		1.4V–1.6V		1.1V–1.3V	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	
t _{PLH} , t _{PHL}	A to B	0.5	6.0	0.5	6.5	1.0	7.0	1.0	8.5	11.5	ns
	B to A	0.6	6.8	0.8	6.9	0.9	7.5	1.0	8.5	9.0	ns
t _{PZL} , t _{PZH}	$\overline{OE}$ to A, $\overline{OE}$ to B		1.7		1.7		1.7		1.7	1.7	μs
t _{skew} ⁽¹¹⁾	A Port, B Port		1.0		1.0		1.0		1.0	1.0	ns

Note:

11. Skew is the variation of propagation delay between output signals and applies only to output signals on the same port (An, or Bn) and switching with the same polarity (LOW-to-HIGH or HIGH-to-LOW). Skew is guaranteed but not tested. See Figure 8.

AC Characteristics (Continued)

$V_{CCA} = 1.1V$ to $1.3V$

Symbol	Parameter	$T_A = -40^{\circ}C$ to $+85^{\circ}C$, $V_{CCB} =$					Units
		3.0V–3.6V	2.3V–2.7V	1.65V–1.95V	1.4V–1.6V	1.1V–1.3V	
		Typ.	Typ.	Typ.	Typ.	Typ.	
t_{PLH} , t_{PHL}	A to B	7.1	6.5	7.0	7.1	13.5	ns
	B to A	10.3	10.5	10.8	11.3	13.5	ns
t_{PZL} , t_{PZH}	$\overline{OE}$ to A, $\overline{OE}$ to B	1.7	1.7	1.7	1.7	1.7	μs
$t_{skew}^{(11)}$	A Port, B Port	1.0	1.0	1.0	1.0	1.0	ns

Note:

11. Skew is the variation of propagation delay between output signals and applies only to output signals on the same port (An, or Bn) and switching with the same polarity (LOW-to-HIGH or HIGH-to-LOW). Skew is guaranteed but not tested. See Figure 8.

Max Data Rate⁽¹²⁾⁽¹³⁾

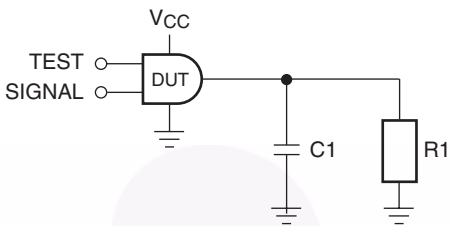
$V_{CCA} =$	$T_A = -40^{\circ}C$ to $+85^{\circ}C$, $V_{CCB} =$					Units
	3.0V to 3.6V	2.3V to 2.7V	1.65V to 1.95V	1.4V to 1.6V	1.1V to 1.3V	
	Min.	Min.	Min.	Min.	Typ.	
3.0V to 3.6V	140	120	100	80	40	Mbps
2.3V to 2.7V	120	120	100	80	40	Mbps
1.65V to 1.95V	100	100	80	60	40	Mbps
1.4V to 1.6V	80	80	60	60	40	Mbps
	Typ.	Typ.	Typ.	Typ.	Typ.	
1.1V to 1.3V	40	40	40	40	40	Mbps

Note:

12. Max Data Rate is guaranteed but not tested.
13. Max Data Rate is specified in megabits per second. See Figure 7. It is equivalent to two times the F-toggle frequency, specified in megahertz. For example, 100 Mbps is equivalent to 50 MHz.

Capacitance

Symbol	Parameter		Conditions	$T_A = +25^{\circ}C$	Units
				Typical	
Cin	Input Capacitance, Control pin ($\overline{OE}$)		$V_{CCA} = V_{CCB} = GND$	3	pF
Ci/o	Input/Output Capacitance	An	$V_{CCA} = V_{CCB} = 3.3V$, $\overline{OE} = V_{CCA}$	4	pF
		Bn		5	
Cpd	Power Dissipation Capacitance		$V_{CCA} = V_{CCB} = 3.3V$, $V_i = 0V$ or V_{CC} , $f = 10MHz$	25	pF

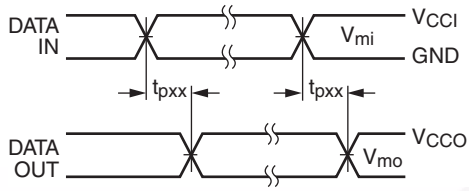


Test	Input Signal	Output Enable Control
t_{PLH} , t_{PHL}	Data Pulses	0V
t_{PZL}	0V	HIGH to LOW Switch
t_{PZH}	V_{CCI}	HIGH to LOW Switch

Figure 1. AC Test Circuit

AC Load Table

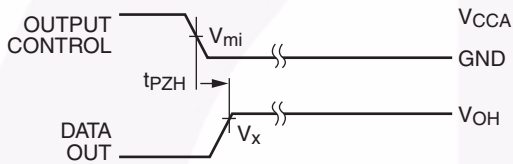
V_{CCO}	CI	RI
$1.2V \pm 0.1V$	15pF	1M Ω
$1.5V \pm 0.1V$	15pF	1M Ω
$1.8V \pm 0.15V$	15pF	1M Ω
$2.5V \pm 0.2V$	15pF	1M Ω
$3.3 \pm 0.3V$	15pF	1M Ω



Input $t_R = t_F = 2.0\text{ns}$, 10% to 90%

Input $t_R = t_F = 2.5\text{ns}$, 10% to 90%, @ $V_i = 3.0\text{V}$ to 3.6V only

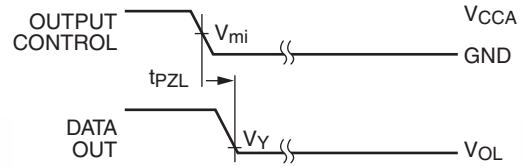
Figure 2. Waveform for Inverting and Non-inverting Functions



Input $t_R = t_F = 2.0\text{ns}$, 10% to 90%

Input $t_R = t_F = 2.5\text{ns}$, 10% to 90%, @ $V_i = 3.0\text{V}$ to 3.6V only

Figure 4. 3-STATE Output High Enable Time for LOW Voltage Logic



Input $t_R = t_F = 2.0\text{ns}$, 10% to 90%

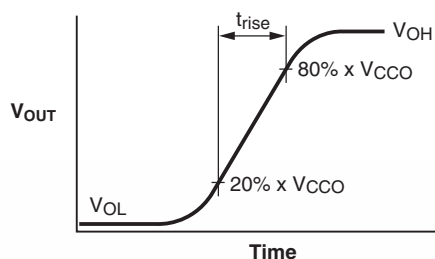
Input $t_R = t_F = 2.5\text{ns}$, 10% to 90%, @ $V_i = 3.0\text{V}$ to 3.6V only

Figure 3. 3-STATE Output Low Enable Time for LOW Voltage Logic

Symbol	V_{CC}
$V_{mi}^{(14)}$	$V_{CCI} / 2$
V_{mo}	$V_{CCO} / 2$
V_X	$0.9 \times V_{CCO}$
V_Y	$0.1 \times V_{CCO}$

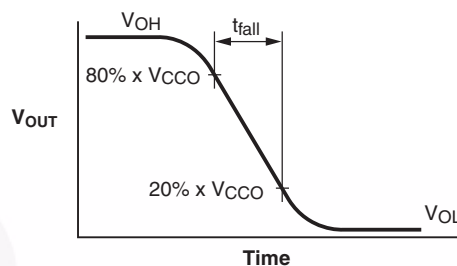
Note:

14. $V_{CCI} = V_{CCA}$ for control pin $\overline{OE}$ or $V_{mi} = (V_{CCA} / 2)$.



$$I_{OHD} \approx (C_L + C_{I/O}) \times \frac{\Delta V_{OUT}}{\Delta t} = (C_L + C_{I/O}) \times \frac{(20\% - 80\%) \times V_{CCO}}{t_{RISE}}$$

Figure 5. Active Output Rise Time and Dynamic Output Current HIGH



$$I_{OLD} \approx (C_L + C_{I/O}) \times \frac{\Delta V_{OUT}}{\Delta t} = (C_L + C_{I/O}) \times \frac{(80\% - 20\%) \times V_{CCO}}{t_{FALL}}$$

Figure 6. Active Output Fall Time and Dynamic Output Current LOW

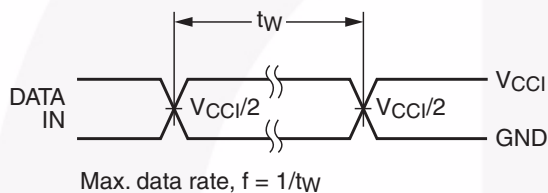
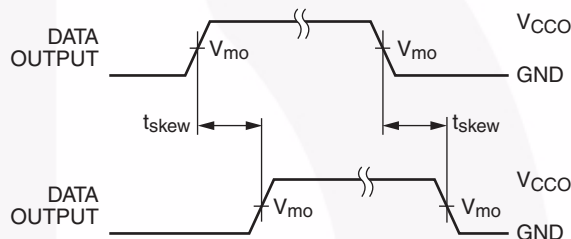


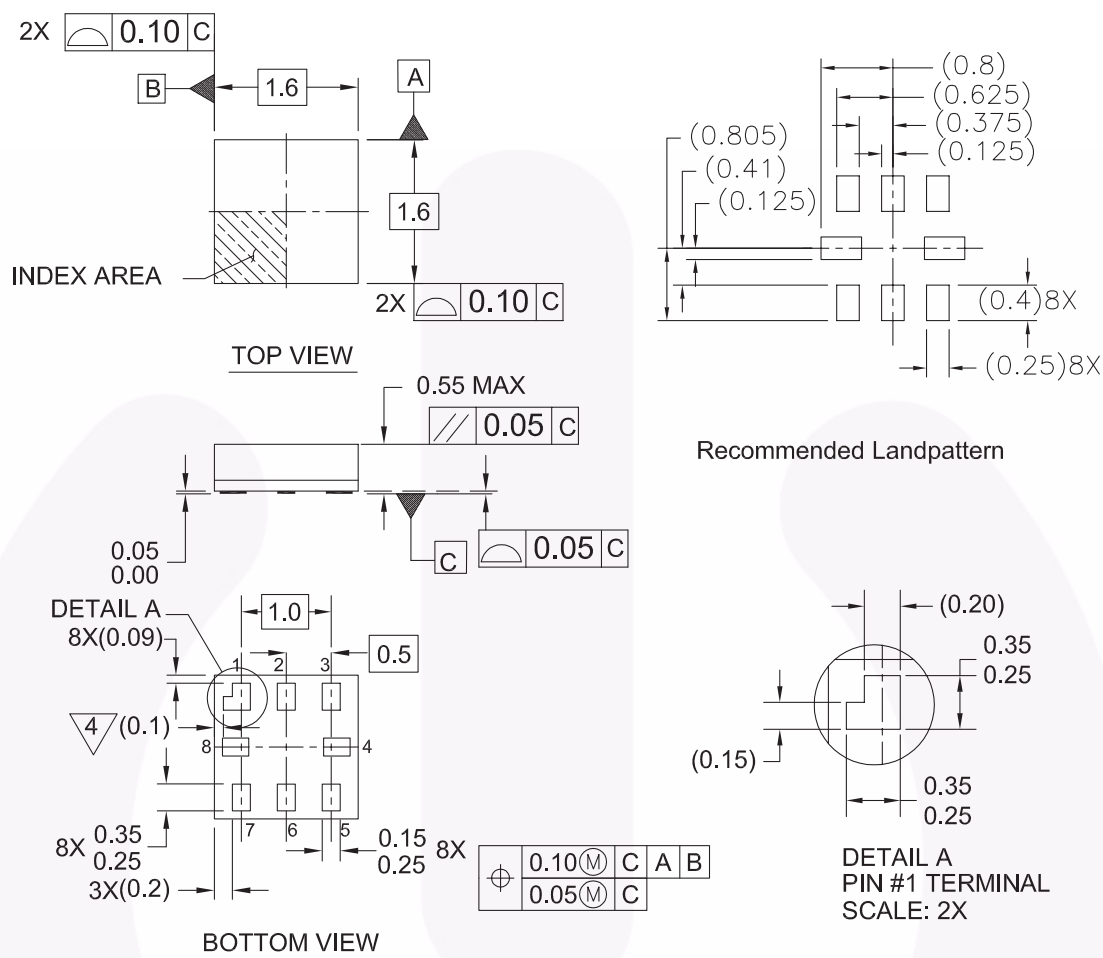
Figure 7. Maximum Data Rate



$$t_{skew} = (t_{pHLmax} - t_{pHLmin}) \text{ or } (t_{pLHmax} - t_{pLHmin})$$

Figure 8. Output Skew Time

Physical Dimensions



Notes:

1. PACKAGE CONFORMS TO JEDEC MO-255 VARIATION UAAD
2. DIMENSIONS ARE IN MILLIMETERS
3. DRAWING CONFORMS TO ASME Y.14M-1994
4. PIN 1 FLAG, END OF PACKAGE OFFSET
5. DRAWING FILE NAME: MKT-MAC08AREV4

MAC08AREV4

Figure 9. 8-Lead MicroPak, 1.6mm Wide

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>



TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

Build it Now™
CorePLUS™
CorePOWER™
CROSSVOLT™
CTL™
Current Transfer Logic™
EcoSPARK®
EfficientMax™
EZSWITCH™ *


Fairchild®
Fairchild Semiconductor®
FACT Quiet Series™
FACT®
FAST®
FastvCore™
FlashWriter® *

FPS™
F-PFS™
FRFET®
Global Power Resource™
Green FPS™
Green FPS™ e-Series™
GTO™
IntelliMAX™
ISOPLANAR™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MillerDrive™
MotionMax™
Motion-SPM™
OPTOLOGIC®
OPTOPLANAR®

PDP SPM™
Power-SPM™
PowerTrench®
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
Saving our world, 1mW at a time™
SmartMax™
SMART START™
SPM®
STEALTH™
SuperFET™
SuperSOT™3
SuperSOT™6
SuperSOT™8
SupreMOS™
SyncFET™


The Power Franchise®
the

franchise
TinyBoost™
TinyBuck™
TinyLogic®
TINYOPTO™
TinyPower™
TinyPWM™
TinyWire™
µSerDes™

UHC®
Ultra FRFET™
UniFET™
VCX™
VisualMax™

* EZSWITCH™ and FlashWriter® are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.